CRANEX® Novus e

Installation and Set-up Manual

208668 rev. 2 (2012-10)

CRANEX® Novus e

Installation and Set-up Manual

$C\epsilon$
0537

Medical Device Directive
93/42/EEC

Contents

1. Introduction

1.1 About this manual

This manual explains how to install and set up the **CRANEX® Novus e** digital panoramic dental x-ray unit (the unit).

You will need to operate the unit during the alignment and checking procedure. Make sure that you know how to operate the unit before starting to install and set up the unit.

It is also essential that person installing and setting up the unit should have attended the manufacturer's service training course.

1.2 Associated documentation

The CRANEX® Novus e User's manual.

The CRANEX® Novus e Service manual (not supplied in the delivery).

The installation and user manuals for the dental imaging software to be used with the unit, for example SCANORA or DIGORA® for Windows (not in the USA).

1.3 Warnings and precautions

During installation

- When installing the unit always observe local and national safety regulation concerning the installation and use of dental x-ray equipment.

- Failure to install the unit in an approved location according to these installation instructions may cause the device to be dangerous to both patient and operator.

- The aperture plate in the collimator is made of lead (Pb) which is a toxic material. Do not touch it with your bare hands.

- Be careful when working on the unit when the covers have been removed.
  - Some mechanical parts have sharp edges that can cause injuries if mishandled.
  - Some internal components become hot during operation. Take suitable precautions to avoid burning yourself.
  - Some electric components are high voltage and can be lethal if touched. Whenever you are making adjustments to the unit disconnect it from the main power supply before making the adjustment.

- If the unit is to be used with a 3rd party imaging application software, not produced or supplied by SOREDEX, the 3rd party imaging software must comply with all applicable local laws and regulations on patient information software. This includes, for example, the Medical Device Directive 93/42/EEC and / or the FDA.

During unit operation

- Read and familiarize yourself with the warnings and precautions in the unit User's Manual.

- When checking the alignment of the radiation beam protect yourself from radiation.

- After the unit has been installed and set up, advise the people who will operate the unit to familiarize themselves with the warnings and precautions in the User's Manual.

1.4 Unit description

Main parts

Exposure warning light

Upper shelf

Wall bar

Column

Focal trough light

Vertical carriage

Head support

CCD sensor

Frankfort light

Display and main control panel

Mirror

Patient handles
Chin support

Midsaggital light

Tubehead

Side control panel

On / off switch (rear of column)

NOTE
Rotating Unit = Tubehead + CCD sensor
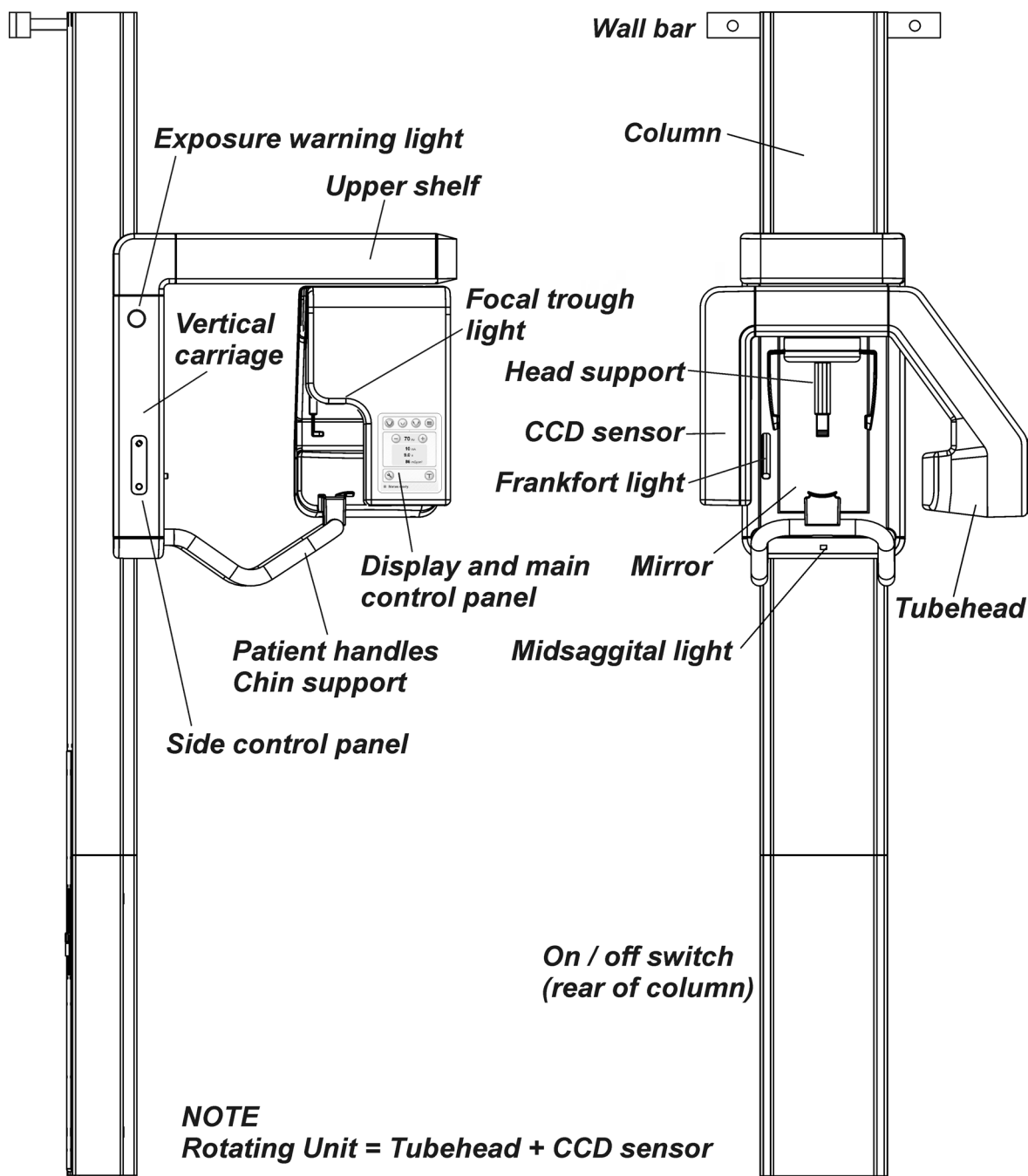
Unit controls
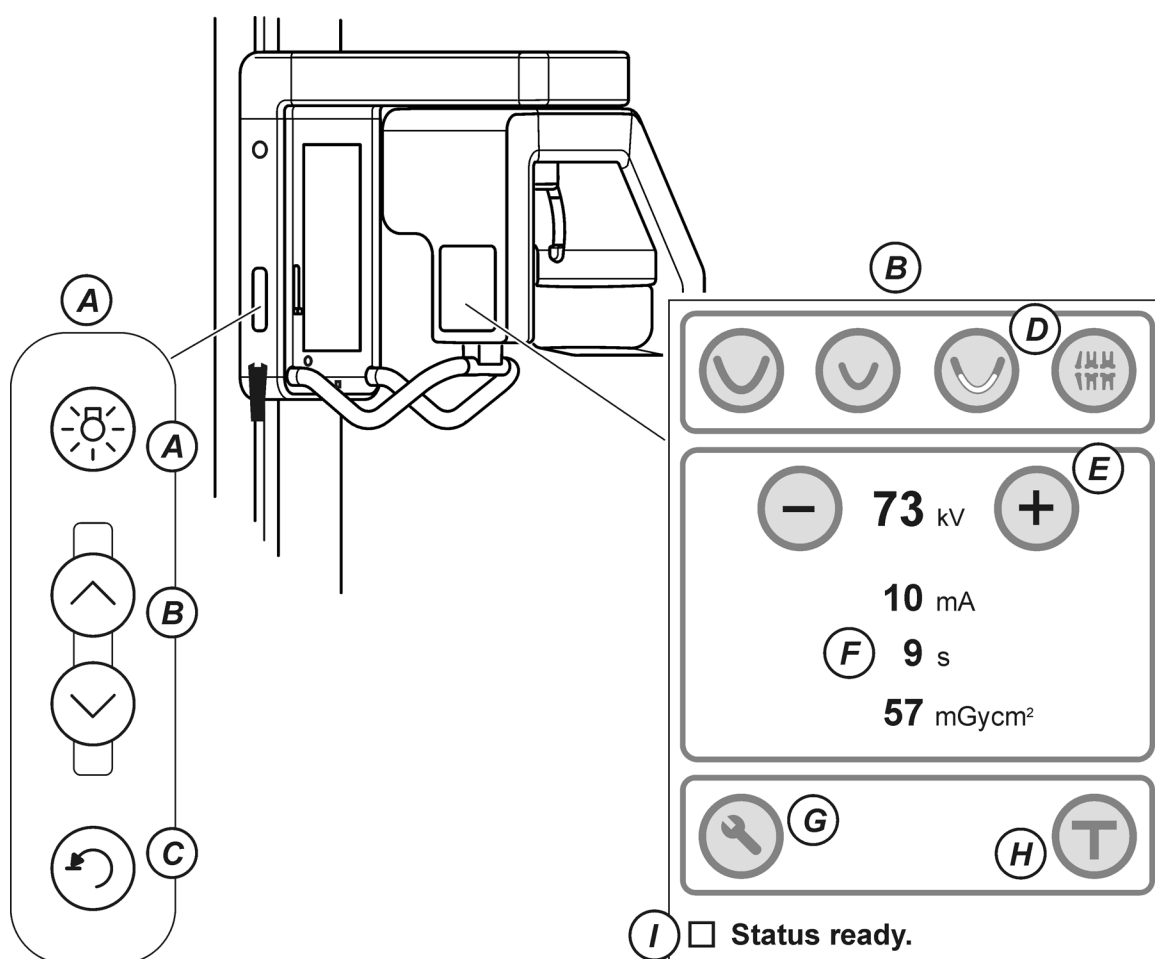
A. Side control panel
A.   Lights key - switches the positioning lights on and off.
B.   Up / down keys
C.   Return key, drives rotating unit to the patient in/out position (PIO)

B. Main control panel
D.   Program keys - adult pan, child pan, TMJ, bitewing (optional)
E.   kV selection keys
F.   Exposure values
G.   Service key
H.   Test exposure key
I.   Unit status indicator

1.5 Disposal of the transportation packaging

The unit is transported in a corrugated cardboard box that is attached to a wooden pallet.
Inside the box preformed expanded polystyrene packaging material protects the unit from shock and damage.

Packaging material	Weight (kg)	*(lb)*
Cardboard box and lid	21.0	*46.3*
Wooden pallet	7.4	*16.3*
Expanded polystyrene	7.6	*16.8*
Total weigh	**36.0**	**79.4**

When disposing of the transportation packaging materials make sure that you follow all local, national and international regulations regarding the correct and safe disposal and/or recycling of these materials.

Some transportation packaging materials may be non-environmentally friendly. These transportation packaging materials must be disposed of in accordance with all local, national and international regulations regarding the disposal of non-environmentally friendly materials.

NOTE:
It is advisable to keep some transportation packaging so that units can be repacked and easily and safely moved to new locations if required.

2. Pre-installation requirements

2.1 The Unit

- The unit is supplied in one box on a pallet. The dimensions of the box with pallet are:-

Length	**Width**	**Height**
191 cm	85 cm	103 cm
76 in	34 in	41 in

- The assembled unit weighs 120 kg (265 lb). Make sure that the floor where the unit is to be installed can support this weight.

- The unit must be permanently attached to the wall or if this is not possible to the show stand.

- If the unit is to be permanently attached to a wall make sure that the fixing hardware to be used to attach the unit to the wall and the wall itself can withstand a continuous pull-out force of at least 300 kg (660 lb).

- The fixing hardware (NOT SUPPLIED) to be used to permanently attach the unit to the wall must be the correct type for the wall material. The diameter of the fixing hardware MUST be 10 mm (3/8 in). DO NOT use smaller diameter fixing hardware.

- If the wall is made of thin material, you may have to use a reinforcing plate on the rear side of the wall to hold the fixing hardware.

- If the wall is not strong enough to support the unit or if you are not sure if the wall will support the unit, use the show stand.

- If the area where the unit is to be installed is subject to earthquakes, and the unit is to be permanently attached to the wall, then the base of the column must be permanently attached to the floor. The fixing hardware (NOT SUPPLIED) to be used must be the correct type for the floor and floor material. The diameter of the fixing hardware MUST be 8 mm (5/16 in).

- The place where the unit is to be installed and the position from where the user will take exposures must be correctly shielded from the radiation that is generated when the unit is operated. Since radiation safety requirements vary from country to country and state to state it is the responsibility of the installer to ensure that all safety requirements are met.

- Do not install the unit in environments where there are corrosive or explosive vapours.

- Special steps regarding EMC need to be taken when installing the unit. For more information refer to the EMC declaration in the user's manual.

- The unit must be installed at least 1.85 m (73 in) away from any non-medical electrical or electromechanical equipment.

- The unit must be connected to its own dedicated power supply:
  - 100 to 120 VAC or
  - 220 to 240 VAC

- Extension cables MUST NOT be used with the unit.

2.2 The PC

- The PC to be used with the unit must be installed in a location that meets all local and national safety requirements with regards the connection of a PC to an x-ray device.

- The connection of the unit to the PC must meet EN60601-1 requirements. The PC must be positioned at least 1.85 mm (73 in) away from the unit.

- The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:

  - use of the accessory in the PATIENT VICINITY

  - evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 601-1 and/or IEC 601-1-1 harmonized national standard.
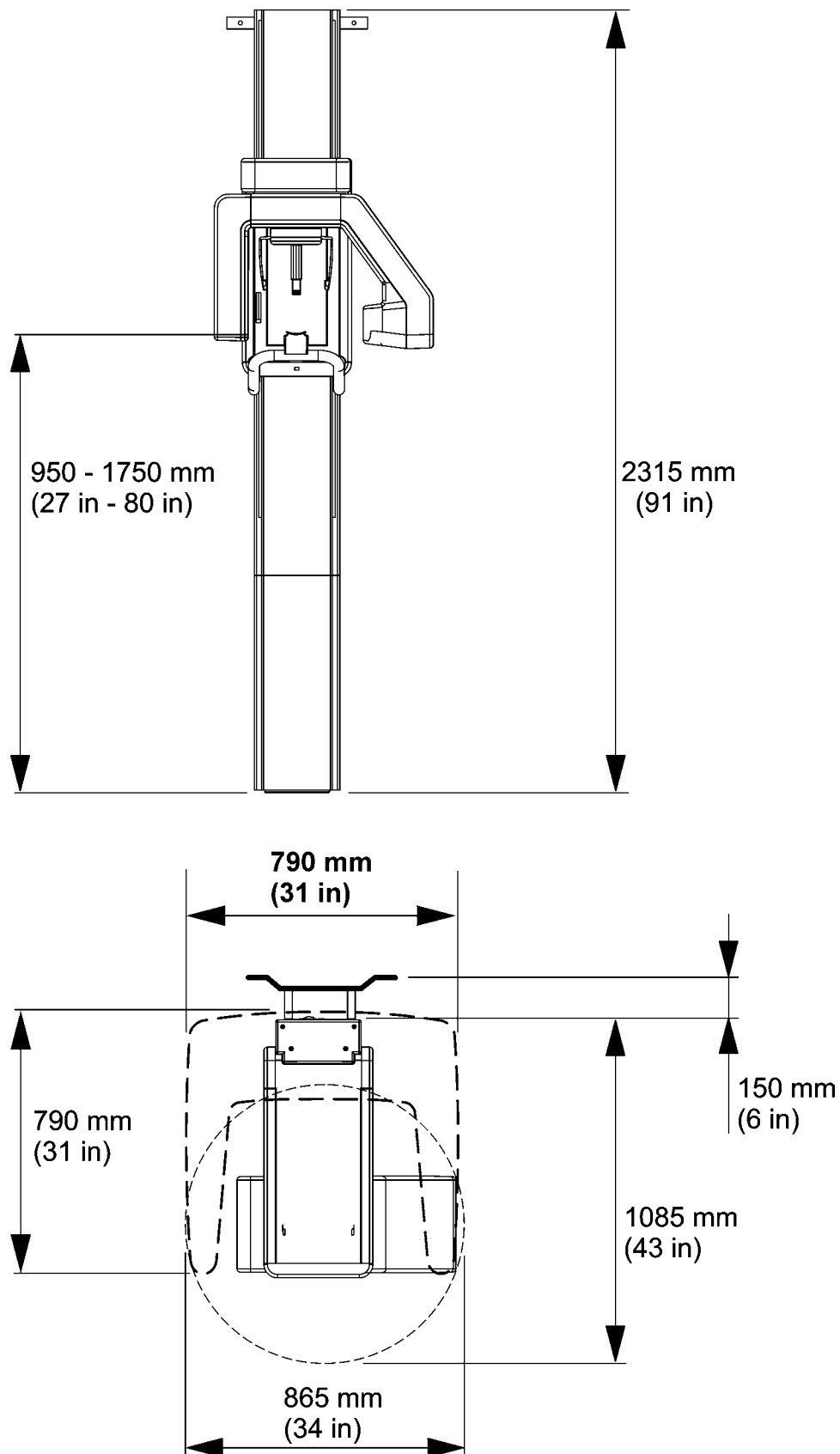
2.3 The dental imaging software

The dental imaging software, for example SCANORA or DIGORA® for Windows (not in USA), that is installed in the PC used to with the unit must be MDD compliant .
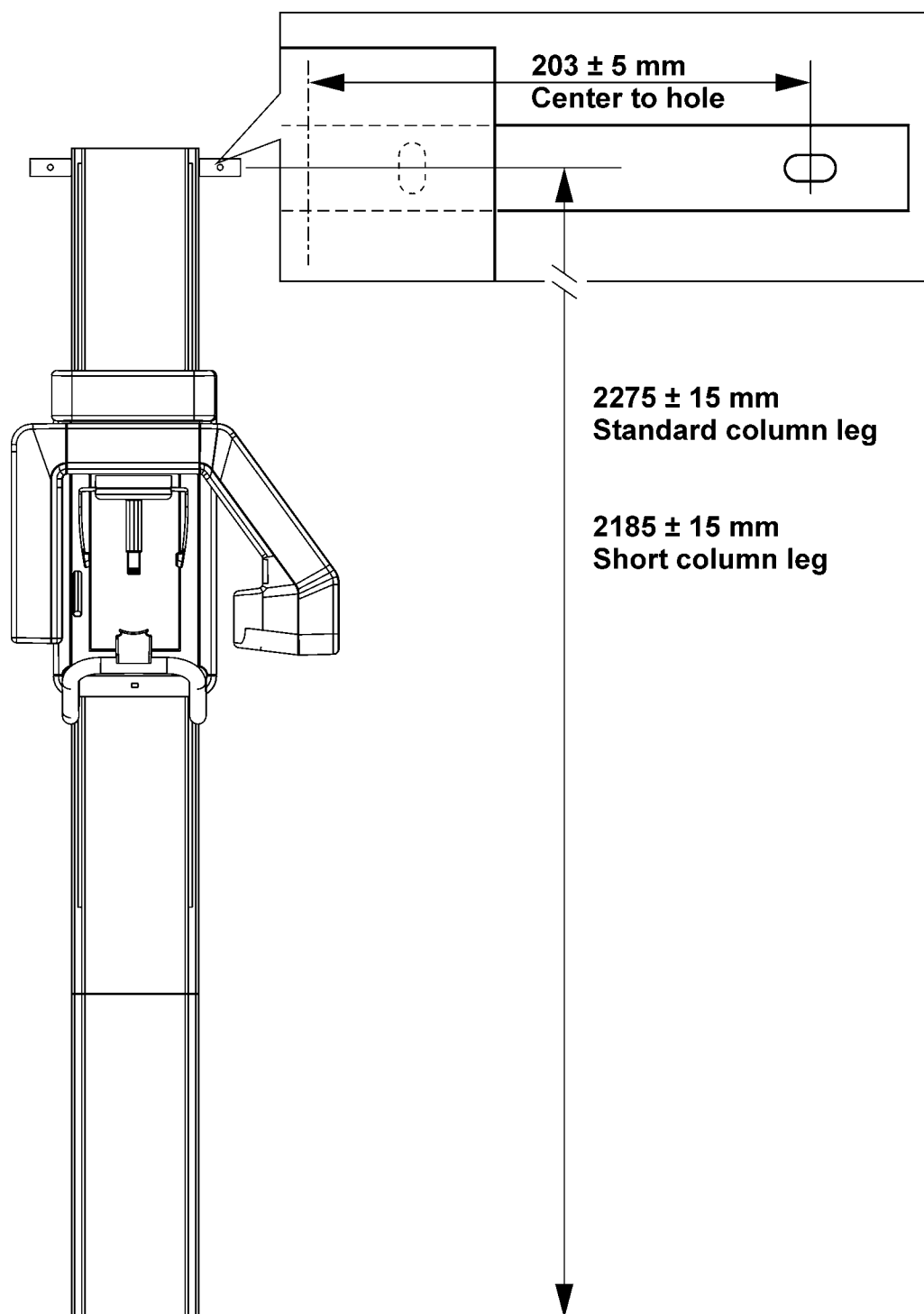
2.4 Space requirements

When installing the unit make sure that:

- there is enough space at the front and sides of the unit to allow patients to enter and exit the unit easily. Patients in wheelchairs will require more space than standing patients.

- the unit is positioned at least 1.85 mm (73 in) away from any non-medical electrical or electromechanical equipment.

- the unit is positioned so that the operator, when protected from radiation, can see and hear the patient during an exposure.

2.5 Unit dimensions

950 - 1750 mm
(27 in - 80 in)

2315 mm
(91 in)

**790 mm
(31 in)**

790 mm
(31 in)

150 mm
(6 in)

1085 mm
(43 in)

865 mm
(34 in)

2.6 Fixing hole dimensions

203 ± 5 mm
Center to hole

2275 ± 15 mm
Standard column leg

2185 ± 15 mm
Short column leg

2.7 Fixing hardware and installation and setup tools

The following tools and hardware are required to install and set up the unit.

NOTE:
THESE ARE NOT INCLUDED IN THE DELIVERY OF THE UNIT, UNLESS OTHERWISE STATED.

Fixing hardware

WALL attachment requires two sets of 10 mm (3/8 in) diameter fixing hardware.
WALL and FLOOR attachment requires two sets of 10 mm (3/8 in) AND two sets of 8 mm (5/16 in) diameter fixing hardware.
The type and length of hardware to be used will depend on the wall material and floor material to which the unit is to be attached.

IMPORTANT NOTE:
Fixing hardware is not required if the show stand is used. Refer to the separate instructions supplied with the show stand.

Installation tools

- Electric drill

- Spanners (wrenches) 7, 10, 17 (two) mm AF

- Hexagon socket wrenches (Allen keys) 1.5 - 8 mm

- Slot blade screwdrivers 0.5 x 3mm, 0.6 x 3.5

- Torx screwdrivers T20, T25, T30

- Spirit level

- Pliers and wire cutters

- Scissors / Knife

- Transportation wheels (pt. no. 200830) (Optional, not supplied with the unit)
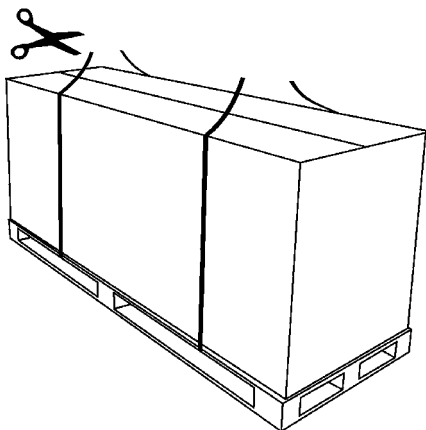
Calibration and setup tools

- Ball-pin alignment tool (pt. no. 201916)

- Test tool (line pair phantom) for countries where this calibration tool is required. (pt. no 6904430)
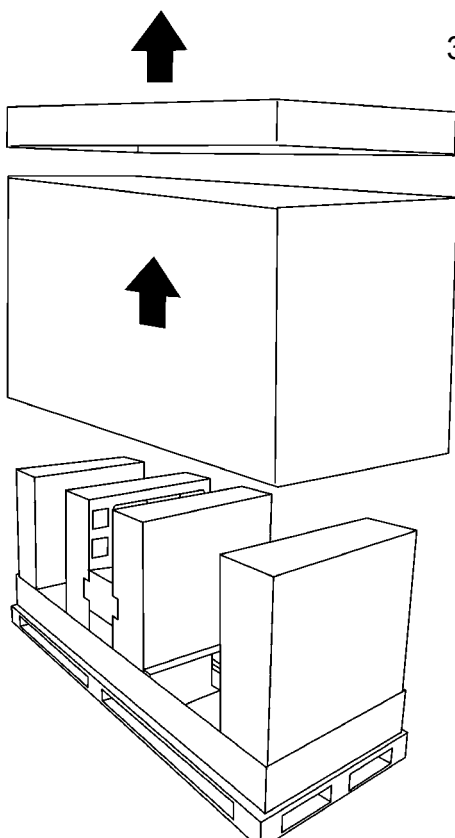
3. Installing the unit
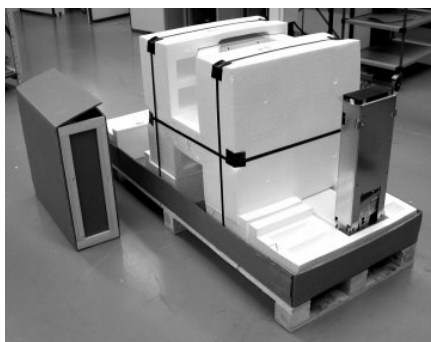
3.1 Preparing the unit for installation

1. Transport the boxed unit to the location where the unit is to be installed.

2. Remove the straps that hold the box to the pallet.

3. Lift off the top of the box and then the sides.

4. Remove all the accessories, the accessory box and as much packaging material as possible.

   NOTE:
   DO NOT remove the packaging material that protects the upper shelf and the rotating unit.

5. Fold down the end of the box that is nearest the hinged section part of the column and then slide the unit over the edge of the pallet so that you can access the underside of the hinged section of the column.
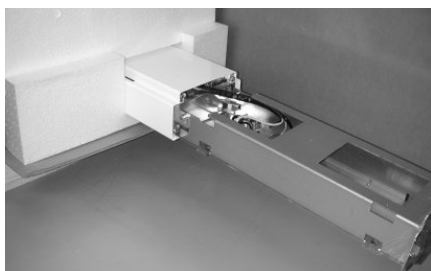

6. **Support the hinged column section before loosening the screws that hold it to prevent it falling and causing damage or injury.** Loosen the screws (the securing nuts are inside the column) on the sides of the column that hold the hinged column section in the vertical position. Turn the hinged column section down so that it is horizontal. Secure it in position with the two screws supplied (M10 x 16), the fixing holes are on the underside (rear) of the column.

   Tighten the two screws (M10 x 16) on the sides of the column.

IMPORTANT NOTE:
If the unit is to be attached to the show stand (pt. no. 9802666), refer to the separate installation instructions supplied with the show stand.

7. Lift the top of the column and slide the packing piece that supported it underneath so that you can access the underside of the column.
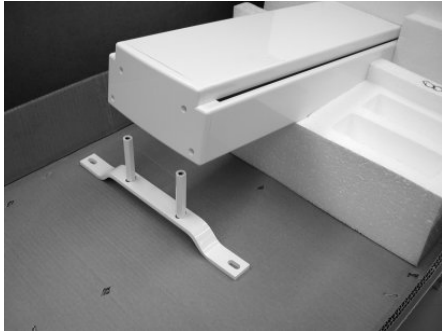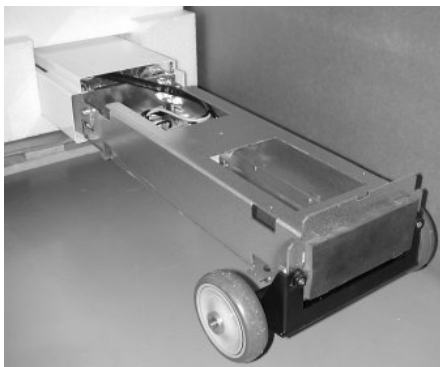
   Attach the two connecting rods to the two screws at the top rear of the column.

   Attach the wall bracket to the connecting rods with the washers and nuts.

3.2 Attaching the unit to the wall

1. **CAUTION - HEAVY OBJECT**
   A minimum of two persons are required for the following task.
   Transport the unit to the place where it is to be installed.

   NOTE:
   The transportation wheels (optional) are attached to the base of the column with two M10 screws and can be used to wheel the unit to the place where it is to be used.
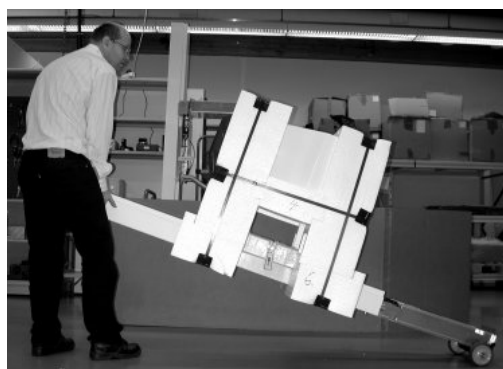
2. Mark the position of the two fixing holes on the wall according to the dimensions given in the section **2.6 Fixing hole dimensions**.

Alternatively, lift the unit into the position where it is to be used and then, using the wall bar as a template, mark the positions where the holes must be drilled. Hold a spirit level on the side of the column and then on the front to help to position the unit so that it is as vertical as possible.

3. Drill two holes with diameters suitable for the 10 mm (3/8 in) fixing hardware being used, and then attach the unit to the wall with the appropriate fixing hardware. Do not fully tighten the screws yet.

4. Remove the packaging material that protects the rotating unit and vertical carriage.

5. Place the spirit level widthwise on the upper shelf and level the unit in the left/right direction.

    Make small adjustments by loosening the wall bar fastenings and moving the top of the column to the left or the right to level the unit.

    Make large adjustments by moving the base of the column left or right.

6. When the unit is level in the left/right direction place the spirit level lengthwise on the upper shelf and level the unit in the forwards/backwards direction.

    Adjustments can be made by moving the base of the column backwards or forwards.
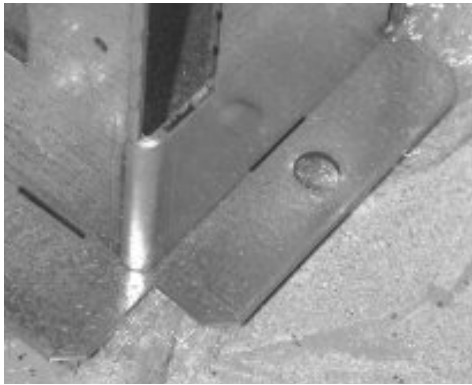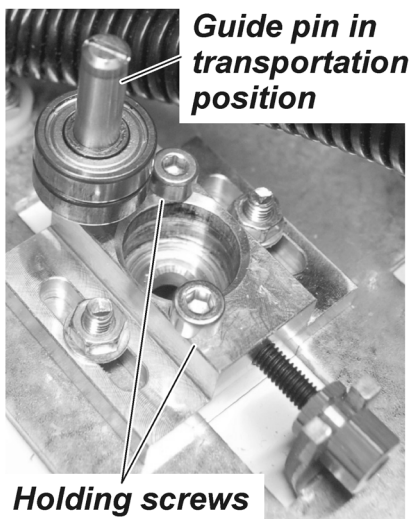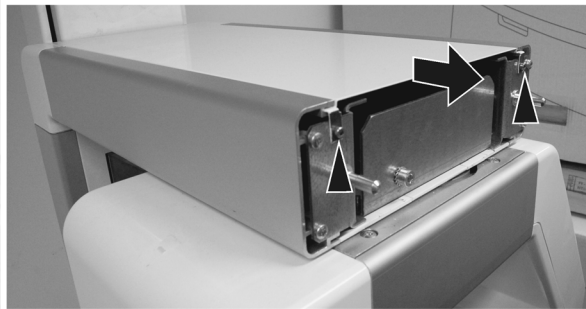
NOTE
If the wall bracket alone does not hold the unit in position rigidly enough, or the unit is to be used in an area prone to earthquakes attach the base of the column to the floor.
Make sure that the unit is level and then mark the positions of the two fixing holes on the floor and then drill two holes of a suitable size for the 8 mm (5/16 in) floor fixing hardware to be used

7. Check once more that the unit is vertical and then tighten all the fixing screws and wall bar fastenings.

8. Pull the front cover from the upper shelf and then remove the two (2) screws that hold the top cover in position and then slide it off.


9. From the upper shelf, unscrew the guide pin and two holding screws from the base plate. DO NOT remove the base plate or loosen the nuts that attach it to the unit.

Guide pin in transportation position

Holding screws

*Base plate*

Plain section downwards

Nut
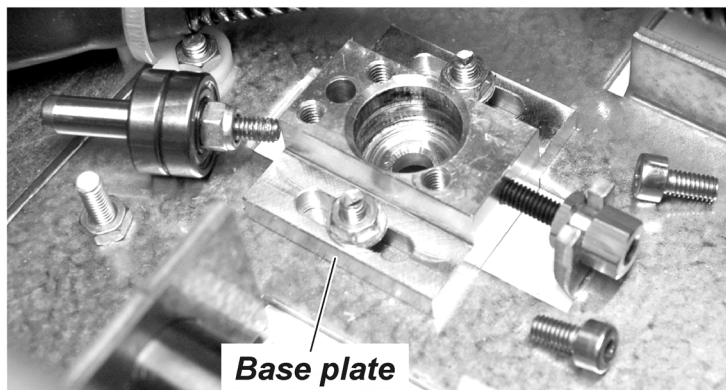
10. Rotate the guide pin assembly and insert it into the hole in the base plate.
Note that the plain section of the guide pin must be downwards and the nut on top.
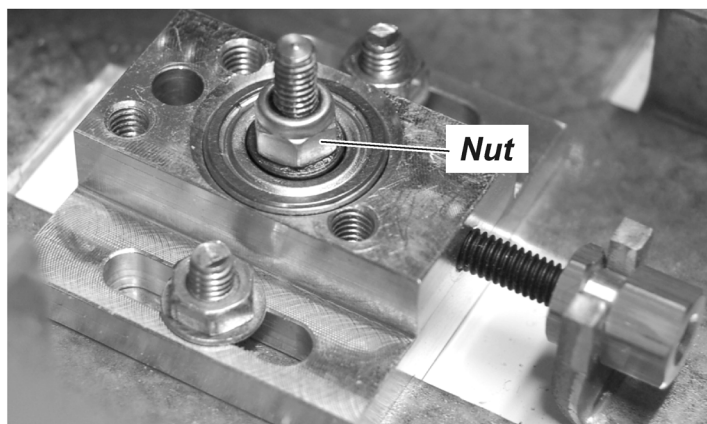
IMPORTANT NOTE:
If the guide pin does not fully enter the hole in the base plate (the top of bearing is NOT level with the top of the base plate) the rotating unit must be moved slightly. To do this remove the transportation screws and packing pieces (see step 12), and then slide the rotating unit gently backwards or forwards until the guide pin drops into place.

Correct

Incorrect
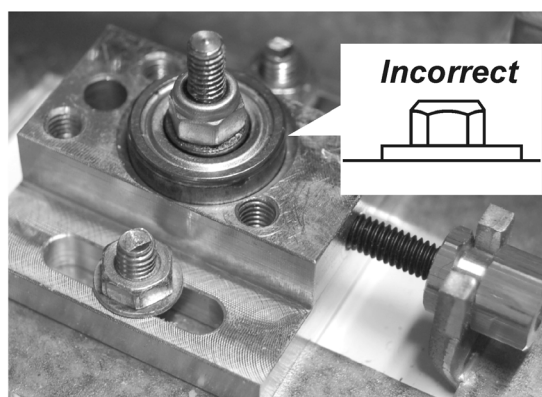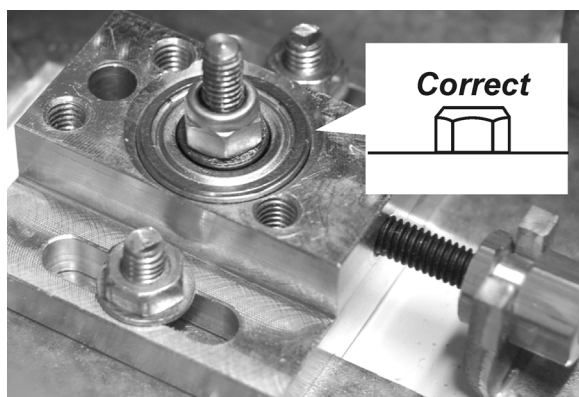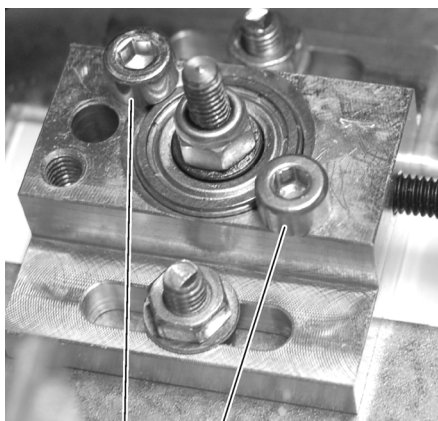
Holding screws

11. Secure the guide pin in position with the two holding screws.

12. Remove the four (4) transportation screws (painted RED) and four (4) packing pieces that hold the rotating unit to the upper shelf.
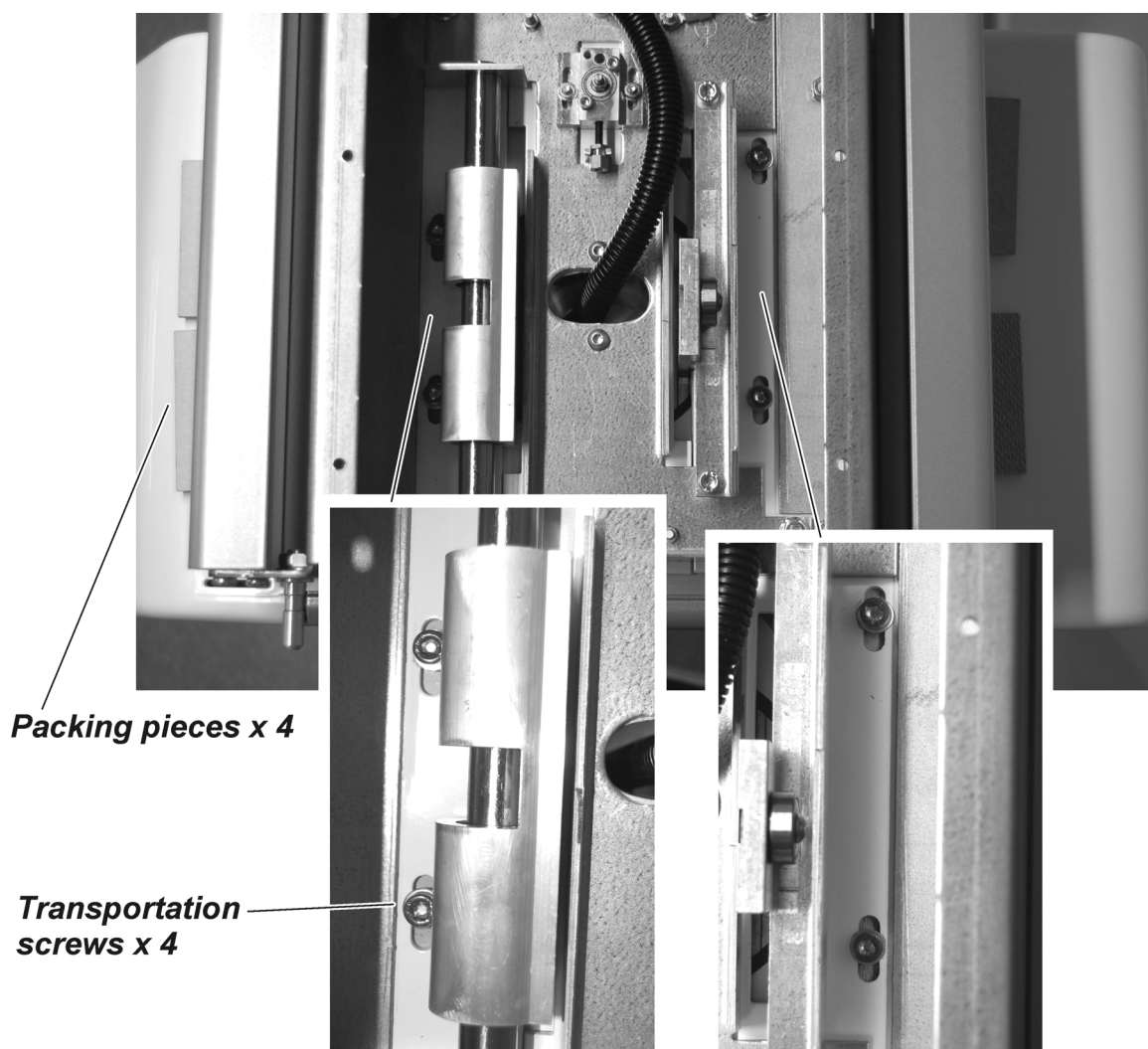
    Now rotate the rotating unit to the Patient in/out position (PIO). Refer to the user's manual.

Packing pieces x 4

Transportation screws x 4

NOTE:
If the unit ever has to be relocated replace the packing pieces, transportation screws and the guide pin assembly (step 9) BEFORE removing the unit from the wall or exhibition stand.

13. Attach the covers to the bottom of the column.

Attach the Front Cover, **A,** to the front of the column with the special long screws (4), they are inserted from the rear. Do not tighten them yet.

Special long screws (x4)

A

B
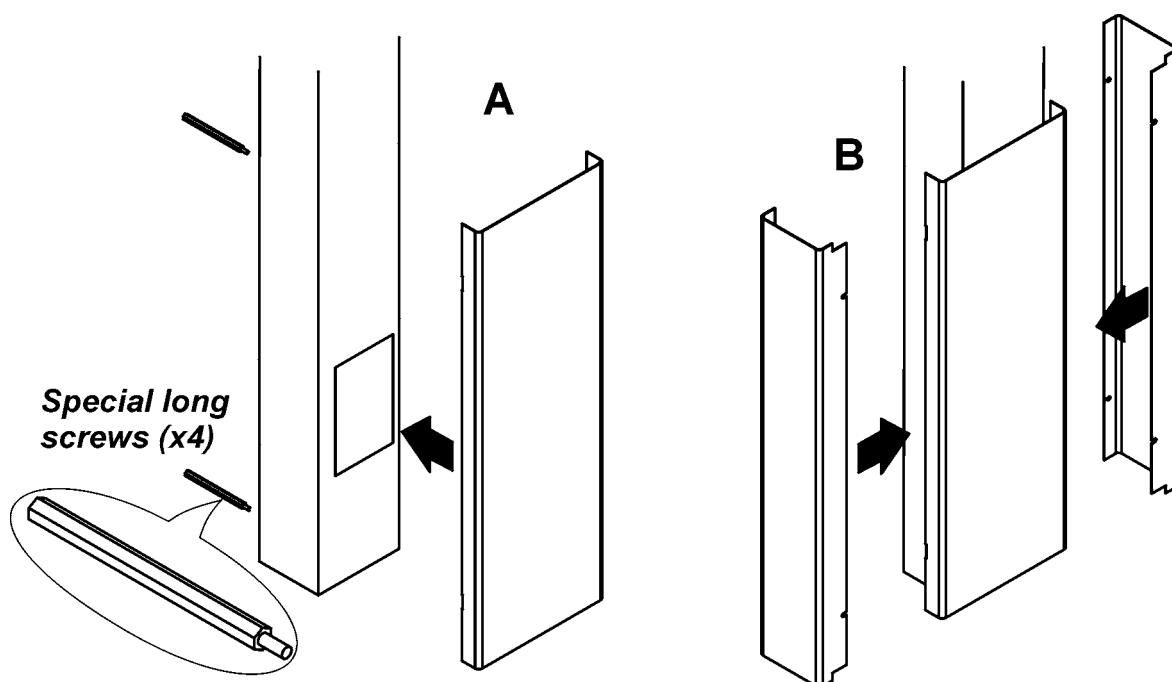
Attach the Side Covers, **B**, to the sides of the column. Note that the front edge of the Side Covers is positioned between the column and the Front Cover. The rear edge is attached to the back of the column with two screws. Tighten all the screws.

3.3 Exposure switch

1. Attach the exposure switch holder to the side of the unit using two (2) screws.

    If the user does not want to have the exposure switch positioned on the unit attach the exposure switch, within the range of the spiral lead, to where requested.

    Make sure that the eposure switch is positioned so that the user can protect themself from radiation and can see the patient during an exposure.

2. Connect the exposure switch cable to the connector at the bottom rear of the column and then place the exposure switch on the exposure switch holder.

3.4 Connecting the unit to the power supply

The unit must be connected to its own dedicated power supply:

- 100 to 120 VAC or

- 220 to 240 VAC

No other equipment should be connected to the same power supply.

Extension cables **MUST NOT** be used to connect the unit to the power supply.

1. The power supply must be equipped with circuit breaker.

2. Connect one end of the power lead to the back of the unit and the other end to the power supply.
   Observe any national and local electrical requirements with regards the connection of dental x-ray equipment to a power supply.

3.5 Preparing the PC

NOTE:

The PC and any other external device(s) connected to the system must meet the IEC 60950 standard (minimum requirements). Devices that do not meet the IEC 60950 standard must not be connected to the system as they may pose a threat to operational safety.

1. Position the PC to be used with the unit at least 1.85 m (73 in) away from the unit.
   Make sure that the patient cannot touch the PC while being x-rayed

   NOTE:
   If the PC to which the unit is to be connected is to be part of a larger system make sure that all the other system components and devices are installed, connected and configured correctly. Refer to the documentation supplied with the other components and devices for information on how to do this.

2. Switch the PC on and install the dental imaging software to be used with the device.
   For information on how to do these refer to the installation/configuration documentation supplied with the dental imaging software.

   IMPORTANT NOTE:
   During the installation when the **Select Features** window appears, make sure that you select the **CRANEX Novus e** option.

3.6 Connecting the unit to the PC

The unit supports 10Base-T/100Base-TX Ethernet connections.

The PC must be connected to the unit in accordance with IEC 60601-1-1.

Connection options

Standalone

With the standalone configuration the unit is connected to a PC, and the unit then reserves the whole network interface card. The unit and PC then function as a single standalone system with no access to other networks.

If it is necessary for the PC to be connected to another network the PC will require two network interface cards.

Unit   *PC*   *Internet*
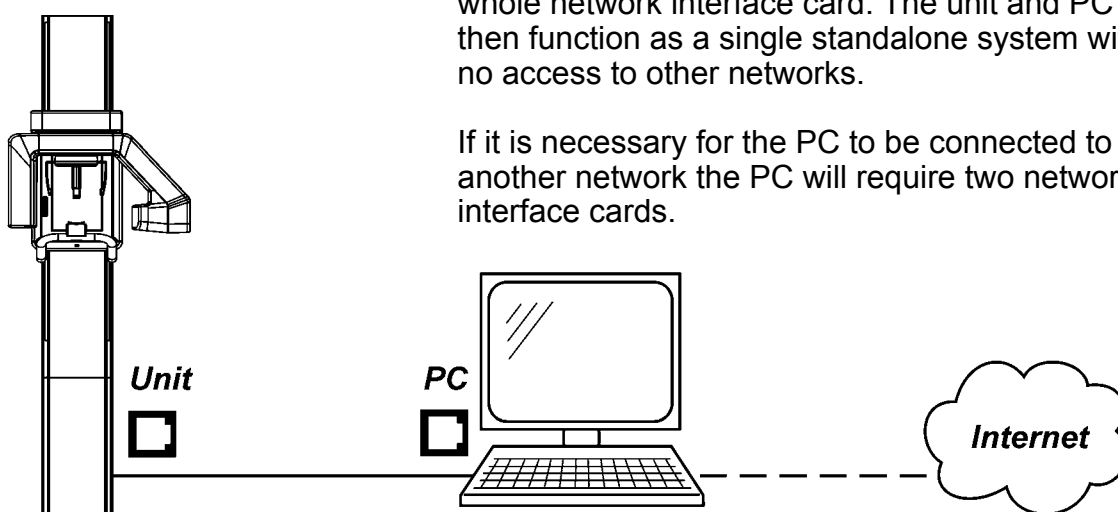
Network

With the network configuration the unit is connected to the PC via a network device. With this configuration the PC is connected to the unit and to other networks with a single network card. The unit is also accessible from other PC's in the same network (same subnet).

For the network configuration you may need a new IP address for the unit from your local system administrator.

Unit   *Network device*   *PC*
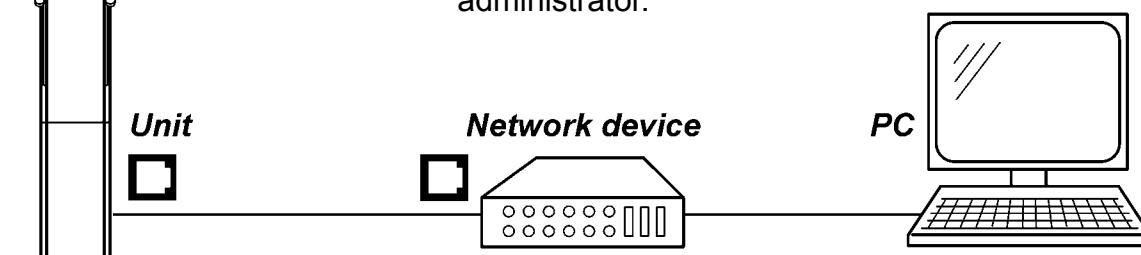
Connection methods

The unit can be connected to the PC in two ways, **Direct connection** or **IP based connection**.
Both of these connection methods allow the unit to be used in either Standalone or Network Configuration.

Direct Connection

Direct Connection is a connection method based on the unit serial number for establishing a connection between the unit and the PC .
Direct connection is not based on IP protocol but instead utilizes a proprietary Ethernet protocol.

NOTE:
In some configurations the PC firewall or other network devices may prevent direct connection from operating. Direct connection requires traffic to be allowed between the PC and unit through the network devices and the PC firewall in inbound/outbound direction for Ethernet protocol ID 0x6000. If there are difficulties with the direct connection use the IP based connection method instead.

IP based connection

IP based connection uses IP Protocol to establish a connection between the unit and the PC. It requires the IP addresses of both the unit and the PC to be configured correctly.

IMPORTANT NOTE:
The default IP address of the unit is:
194.9.227.251 and the subnet mask is fixed to 255.255.255.0.

The unit offers two alternatives for configuring its IP address, **Remote** and **Manual**. With the **Remote** alternative the unit receives its IP address from the PC. With the **Manual** alternative the user sets the IP address of the unit using the Graphical User Interface (GUI) of the unit.
It is recommended that **Remote** alternative is used when configuring the IP address of the unit. However, if problems occur, due to firewalls etc., use **Manual** alternative instead.

The **Remote** alternative is explained as part of the section **Connection using IP based connection method**.
The **Manual** alternative is explained in section **Manually changing the IP address**.

IMPORTANT NOTE:
The unit can have any IP address but the unit and PC must always be in the same subnet. For example IP for PC 194.9.227.250 and IP for the unit 194.9.227.251 and the subnet mask is fixed to 255.255.255.0.

Connection using the Direct Connection method

1. **Standalone configuration**.
   Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the PC.
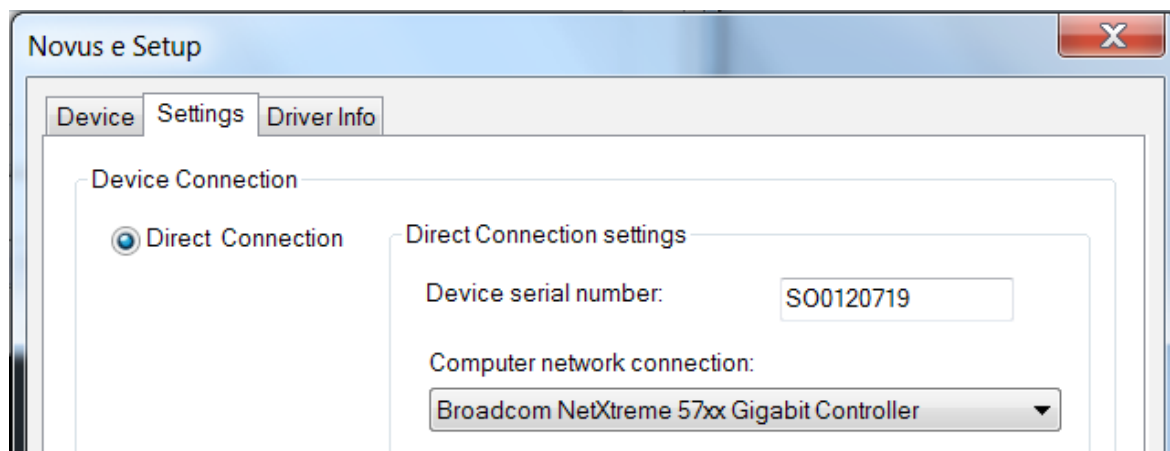
   Network configuration.
   Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the network.

2. Switch the Unit on.

3. **PC**: Start the PC and then open the dental imaging software that you installed.

4. **PC**:
   SCANORA: In the **Tools / Cranex Novus e Setup** window select the **Settings** page.

   DfW: In the **Options / Cranex Novus e Setup** window select the **Settings** page.

In the **Device Connection** section, click the **Direct Connection** radio button and then key in the complete device Serial Number of the unit (it is on the type label) into the **Device serial number** field.

Select the correct Network Interface Card (NIC) from the **Computer network connection** drop down list.
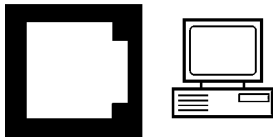
NOTE:
If there is more than one NIC in the PC make sure that you select the one that is connected to the device.

Click **OK** to save the settings.

5. The unit will automatically connect to the PC within 5-15 seconds.
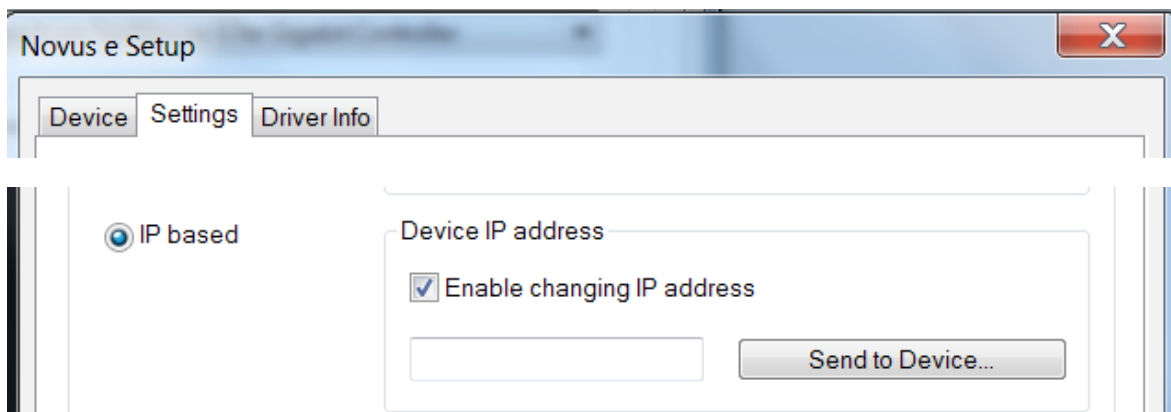
Connection using the IP based method

1. **Standalone configuration:** Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the PC.

   Network configuration: Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the network.

2. Switch the Unit on.

3. **PC**: Start the PC and then open the dental imaging software that you installed.

4. **PC**:
   SCANORA: In the **Tools / Cranex Novus e Setup** window select the **Settings** page.

   DfW: In the **Options / Cranex Novus e Setup** window select the **Settings** page.

In the **Device Connection** section, click the **IP based** radio button to select it.
Then click the **Enable changing IP address** check box to activate the IP-address field.

5. Touch the service button on the main control panel of the unit.

   IMPORTANT NOTE:
   The unit can have any IP address but the unit and PC must always be in the same subnet. The subnet mask of the unit is fixed to 255.255.255.0.

   NOTE:
   With the network configuration the default IP address of the unit must be changed to the IP address obtained from your local IP administrator.
   With standalone configuration, you can avoid changing the IP address of the unit by setting the IP address of the PC to the same sub net as the default value of the unit. After changing the PC IP address in this way proceed to step 11 to finish the configuration.
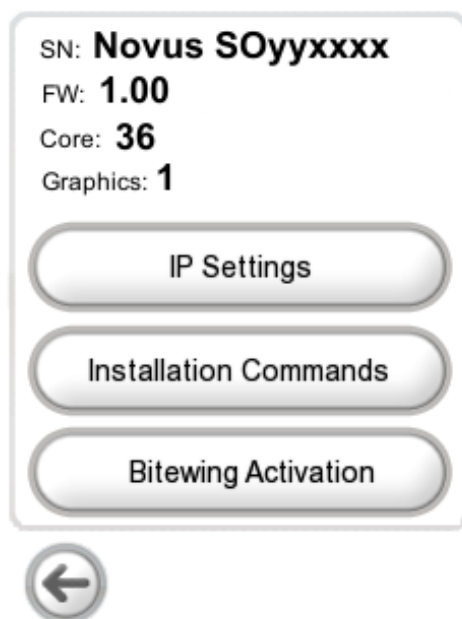
6. The configuration screen will appear on the display. It shows the unit serial number, the firmware version numbers and several function buttons, **IP Settings**, **Installation commands** and, optionally, **Bitewing Activation**.

   Select **IP Settings**

   NOTE:
   See section 4 for information about **Installation Commands** and section 3.7 for information about **Bitewing Activation**.

7. The IP configuration modes will appear on the screen, **Remote** or **Manual**.

Current IP-address:
194.9.227.251

Choose IP Configuration Mode

(MANUAL)
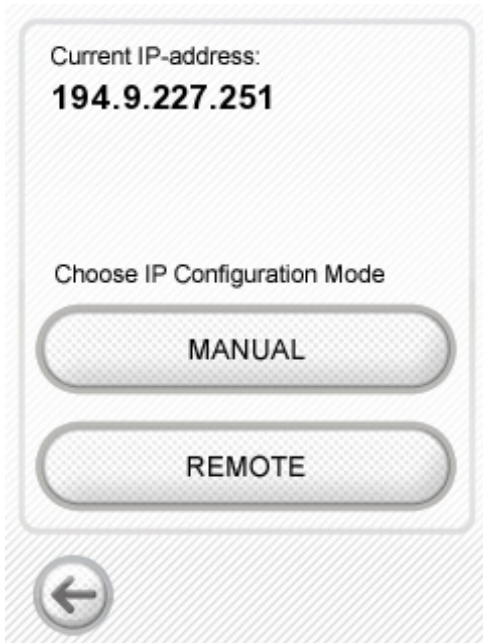
(REMOTE)   Select **Remote**.

←

8. The IP address window will appear which shows the current IP address of the unit.

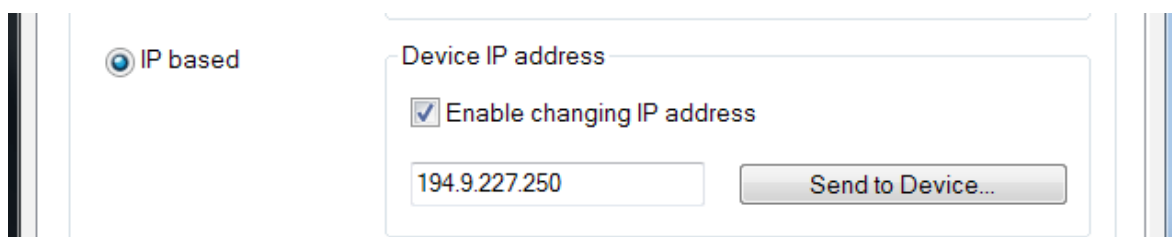Current IP Adress:
194.9.227.251

←   ✓

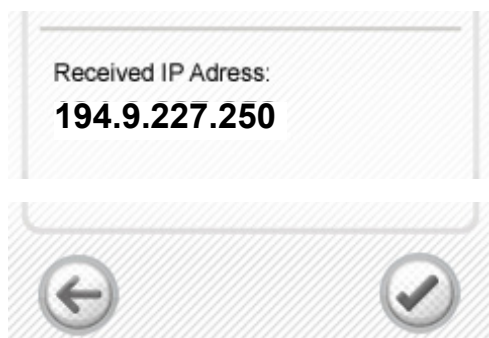9. **Standalone configuration:**
   PC: In the IP-address field key in the desired IP address of the unit, for example 194.9.227.250, and then click the **Send to Device ...** button.

   Network configuration:
   PC: Key in the new IP address (obtained from the network administrator) into the IP-address field key and press the **Send to Device…** button.

10. The new IP address will appear on the screen.

   Touch the **OK** button to accept the IP address and then the **Arrow** button to return to the main screen.

11. **PC:** Click the OK button to close the settings window.

   NOTE:
   If the remote IP address setting fails use the MANUAL method. See section **Manually changing the IP address**.
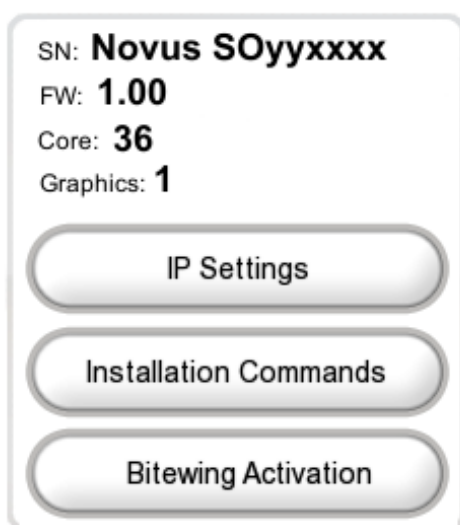
Manually changing the IP address

The IP address of the unit can be changed manually.

NOTE:
Always set the IP address of the PC before changing the IP address of the unit.

1. Touch the service button on the main control panel of the unit.

2. The configuration screen will appear on the display. It shows the unit serial number, the firmware version numbers and several function buttons, **IP Settings**, **Installation commands** and, optionally, **Bitewing Activation**.
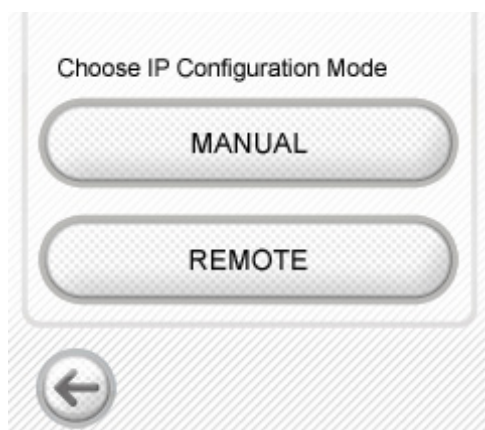
SN: **Novus SOyyxxxx**
FW: **1.00**
Core: **36**
Graphics: **1**

IP Settings

Installation Commands

Bitewing Activation

Select **IP Settings**

NOTE:
See section 4 for information about **Installation Commands** and section 3.7 for information about **Bitewing Activation**.

3. The IP configuration modes will appear on the screen, **Manual** or **Remote**.

Choose IP Configuration Mode

MANUAL

REMOTE

Touch the **Manual** button.

IP Address:

194.9.227.253

4. The Manual IP address connection screen will appear.
   Key in the new IP address.

   When the new IP address has been keyed in the **OK** (tick) button will become active.

   Touch the **OK** (tick) button to accept the change and return to the main display.
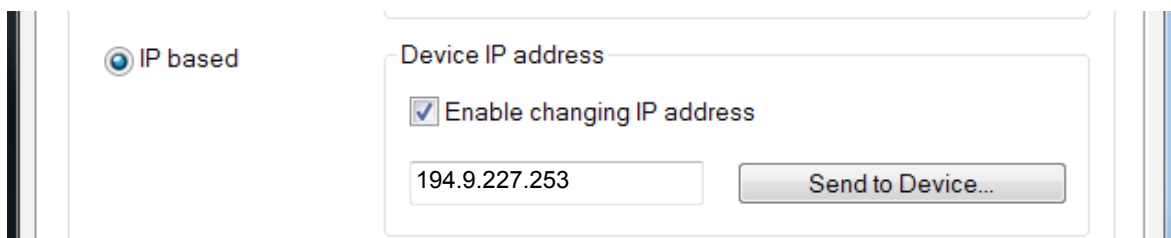
   Touch **Arrow** button to discard the change and return to the main display.

5. **PC**:
   SCANORA: In the Tools / Cranex Novus e Setup window select the Settings page.

   DfW: In the Options / Cranex Novus e Setup window select the Settings page.

   In the **Device Connection** section, click the **IP based** radio button to select it. Then click the **Enable changing IP address** check box to activate the IP-address field.

6. **PC:** Key in the new IP address into the IP-address field.

IP based

Device IP address

☑ Enable changing IP address

194.9.227.253   Send to Device...

■ Status ready.

7. **PC:** Click the OK button to close the settings window.

   The **Ready** indicator will turn green.

Multi-connect

Multi-connect allows the unit to be used by several PCs within a network. A PC must "reserve" the unit before it can be used.

1. **PC:**
   SCANORA: In the **Tools / Cranex Novus e Setup** window select the **Settings** page.

   DfW: In the **Options / Cranex Novus e Setup** window select the **Settings** page.

2. **PC:** Click the **Use Multi-Connect** check box to select it and then, from the drop down list, select a unique **Workstation identifier** number (between 1 and 8) for the PC being configured. Additional workstation information, for example, user name, location etc, can be entered into the field next to the work station identifier number.

Multi-Connect

☑ Use Multi-Connect

Workstation identifier: 1 ▼   ROOM1

Device Autorelease timeout, seconds: 15

OK   Cancel
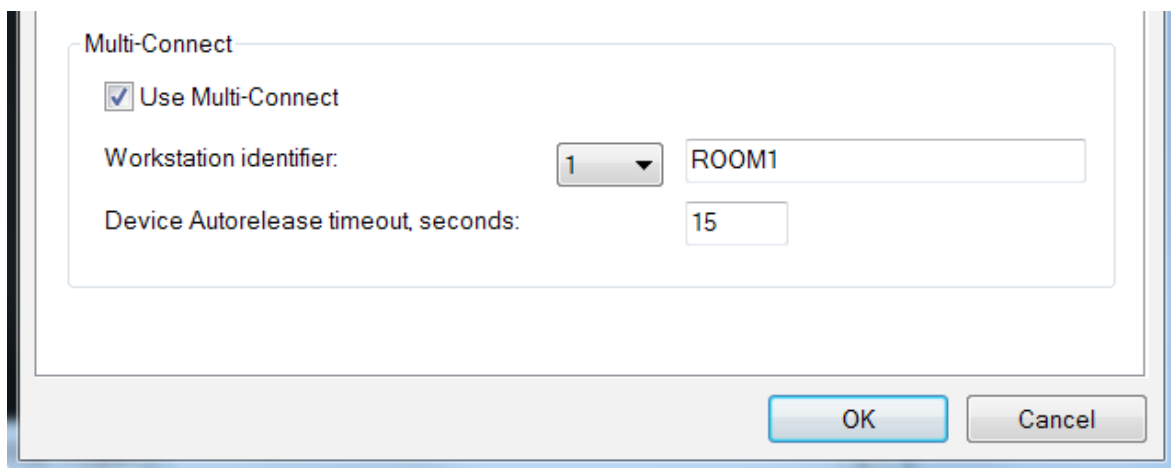
The **Device Autorelease timeout** is the length of time that the unit will remain reserved and **usable** by a PC. After the set time elapses the PC automatically releases the unit so that it can be used by another PC in the network (the unit can be reserved in advance from another PC).
The default setting is 300 seconds. This can be changed by keying in a new value.

3. **PC:** Click **OK** to connect the PC to the unit.
   NOTE:
   An automatic technique will automatically locate the unit within the local area network and connect the PC.

4. **PC:** Repeat the above process for all the other PCs in the network. Make sure that you give each PC a different **Workstation identifier**.

5. Check the installation by starting image capture using the imaging software.
   If the **Use Multi-Connect** was selected the Workstation identifier of the PC (1 - 8) being used will appear on the unit display.

■ **Status ready**   🔒 **2**

3.7 Activating the optional bitewing program

NOTE:
> If the **Bitewing Activation** button does NOT appear it indicates that the bitewing program has been installed at the factory

1. Order the bitewing License Key from SORE-DEX Customer Service. The order code is 900669 Bitewing Program Upgrade.

    When ordering you need to give the Serial Number of the unit in which the bitewing program will be activated.

    SOREDEX Customer Service will e-mail the license key to you.

2. Switch on the unit and touch the service button to enter the service mode.

3. Click the **Bitewing Activation** button.

SN: **Novus SOyyxxxx**
FW: **1.00**
Core: **36**
Graphics: **1**

Bitewing Activation
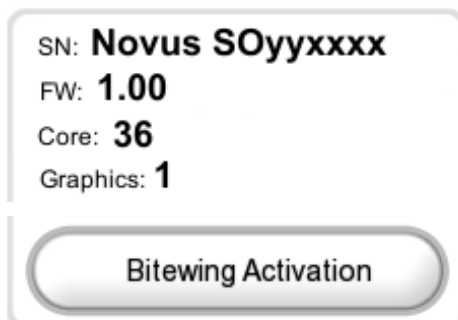
4. A keypad will appear which allows you to enter the license code.
    Enter the activation code, press **OK** (tick) and the bitewing program will be activated.

    Press the **Back** button twice to return to the main menu.

5. Restart the unit to activate the bitewing program.

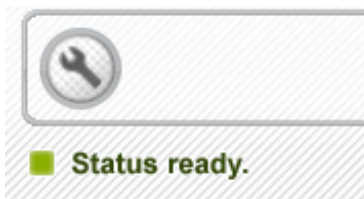# 4. Checking the alignment and finishing the installation

4.1 Checking the alignment of the CCD Sensor

1. **PC:** Prepare the unit for an exposure.
   NOTE:
   If the dental imaging software prompts an error message "Please calibrate the device" on startup, perform CCD re-calibration as described in section 5.4.

2. Remove the chin rest.

3. Touch the service button on the main control panel of the unit to open the configuration window.
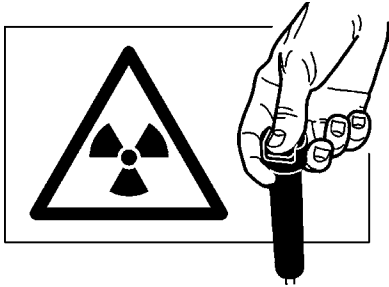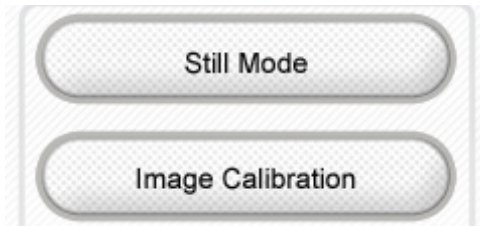
4. Select **Installation Commands**.

5. The PIN number screen will appear. This is a security feature to prevent the user from accidentally accessing the installation / service commands.

   Key in **1204** and touch the **OK** key.

6. The service function will appear on the screen. Select **Still Mode**.

Still Mode

Image Calibration

7. **Protect yourself from radiation**.
Press and hold down the exposure switch to take an exposure.

8. **PC:** Use the dental imaging software to examine the image that appears.
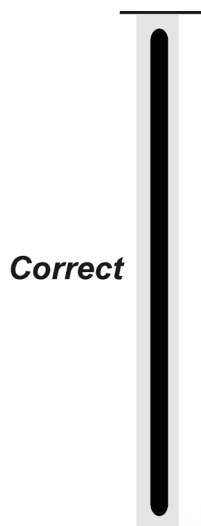
If the CCD sensor is correctly positioned the image will show a vertical black line (the beam) in the middle of a vertical light gray area (the CCD aperture).
Both the beam (black line) and the CCD aperture (light gray area) must be vertical and the bottom edge of the beam (black line) must be between 0.1 and 2 mm from the bottom edge of the image.

Correct

If the beam (black line) is not in the middle of the CCD aperture (the gray area) or the CCD aperture (gray area) is not vertical, the CCD sensor must be adjusted. See 5.1 Aligning the CCD sensor.
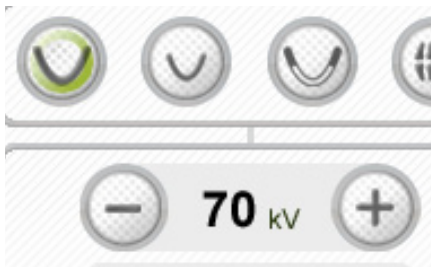
9. Touch the **Arrow** button to exit the **Still Mode** and return to the main menu.

4.2 Checking the image geometry (ball-pin phantom test)
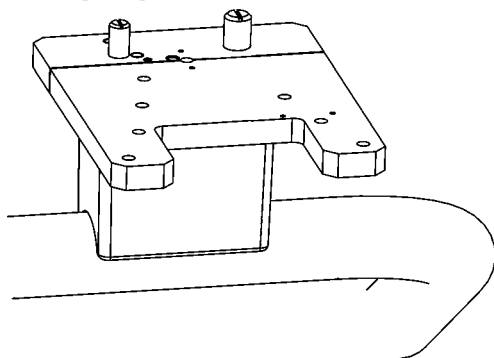
1. **PC:** Prepare the unit for an exposure.

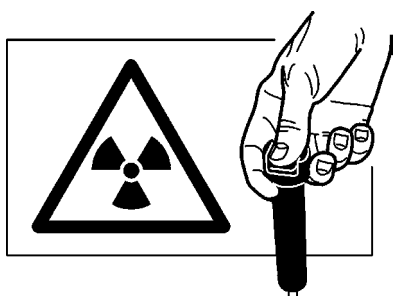2. Replace the chin rest.

PAN

3. Set up the unit to take an **adult panoramic** exposure at **70 kV**.
   Refer to the unit user's manual for information on how to do this.

Ball/pin phantom

5. Attach the **ball-pin tool** to the chin support.

6. **Protect yourself from radiation.**
   Press and hold down the exposure switch to take an exposure.

7. **PC:** Use the measuring tools in the dental imaging software to examine the dimensions of the balls that appear on the image. Magnify the image so that you can accurately measure the dimensions.

If the image geometry is correct the center ball must be round with no more than **0.2 mm difference** between the horizontal diameter and the vertical diameter.

Also the distance from the center ball to the furthest left-hand ball (Distance left) and the furthest right-hand ball (Distance right) must be the same, with no more than **±2.0 mm difference** between them.
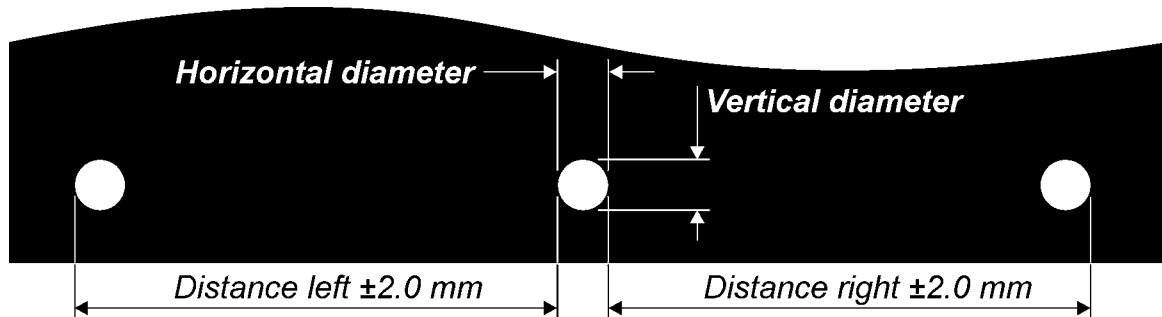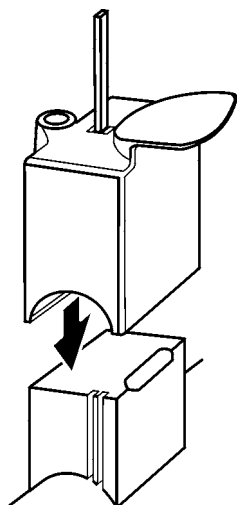

If the center ball is NOT ROUND and/or the distances between the balls are NOT WITHIN THE TOLERANCE, then the rotating unit (RU) or the chin rest must be adjusted.
See 5.2 Adjusting the image geometry.

IMPORTANT NOTE:
In some cases you may have to adjust the position of both the rotating unit AND the chin rest.

4.3 Checking the positioning lights

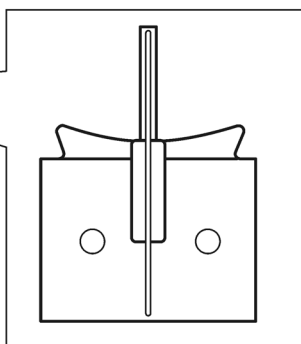### Midsagittal light

1. Attach the chinrest and a rod to the support holder.
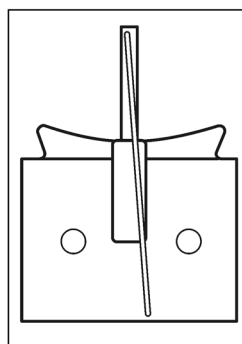
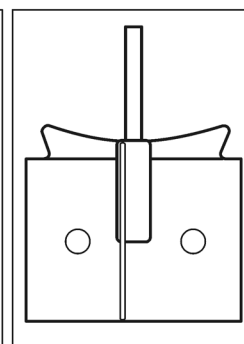   Press the light button to switch the patient positioning lights on.

    The light beam must be vertical and strike the center of the rod

| *Correct* | *Incorrect* | *Incorrect* |

    If the beam is not in the correct position it must be adjusted. See 5.3 Adjusting the positioning lights.

Frankfort light

1. Draw a horizontal line on a sheet of paper parallel to one side. Remove the chin rest and hold the piece of paper on the chin rest support

2. Press the light key. The frankfort light must be parallel to the line on the piece of paper.

   If the beam is not in the correct position it must be adjusted. See 5.3 Adjusting the positioning lights.
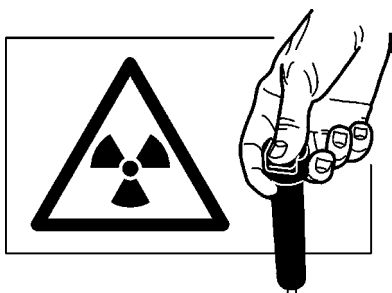
Focal trough light

1. Attach the ball phantom to the support holder.

2. Press the light button to switch the patient positioning lights on. The light beam must strike the line that crosses the ball phantom
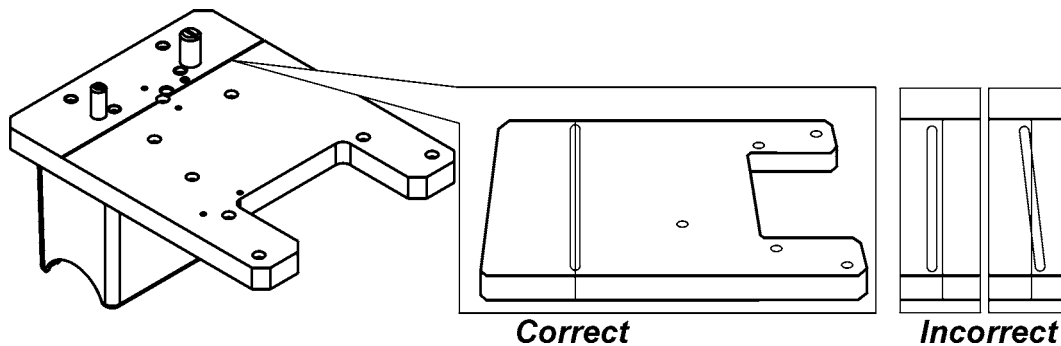
Correct   *Incorrect*

If the beam is not in the correct position it must be adjusted. See 5.3 Adjusting the positioning lights.

4.4 Completing the Installation

Check that the unit functions correctly:

-   Take a test exposure to verify that the unit operates correctly and the image is transferred successfully to the PC.

    Protect yourself from radiation when taking the exposure.

-   Check the up/down keys drive the unit up and down.

-   Check that the light key switches the positioning lights on and off.

-   Check that the lights come on when the mirror is opened.

-   Check that when the emergency switch is pressed the unit stops operating.

Finally replace all the covers that were removed.

5. Aligning the unit

5.1 Aligning the CCD sensor

If the sensor was not correctly aligned after carrying out the alignment check (4.1 Checking the alignment of the CCD Sensor) the sensor must be repositioned and new beam images taken to confirm that it is correctly positioned.

1. Remove the inner sensor cover from the rotating unit, it is held in place with four (4) screws

2. To adjust the CCD sensor loosen the four nuts (A) that hold the CCD sensor in place and then adjust its position with the two screws (B) on the left-hand side.
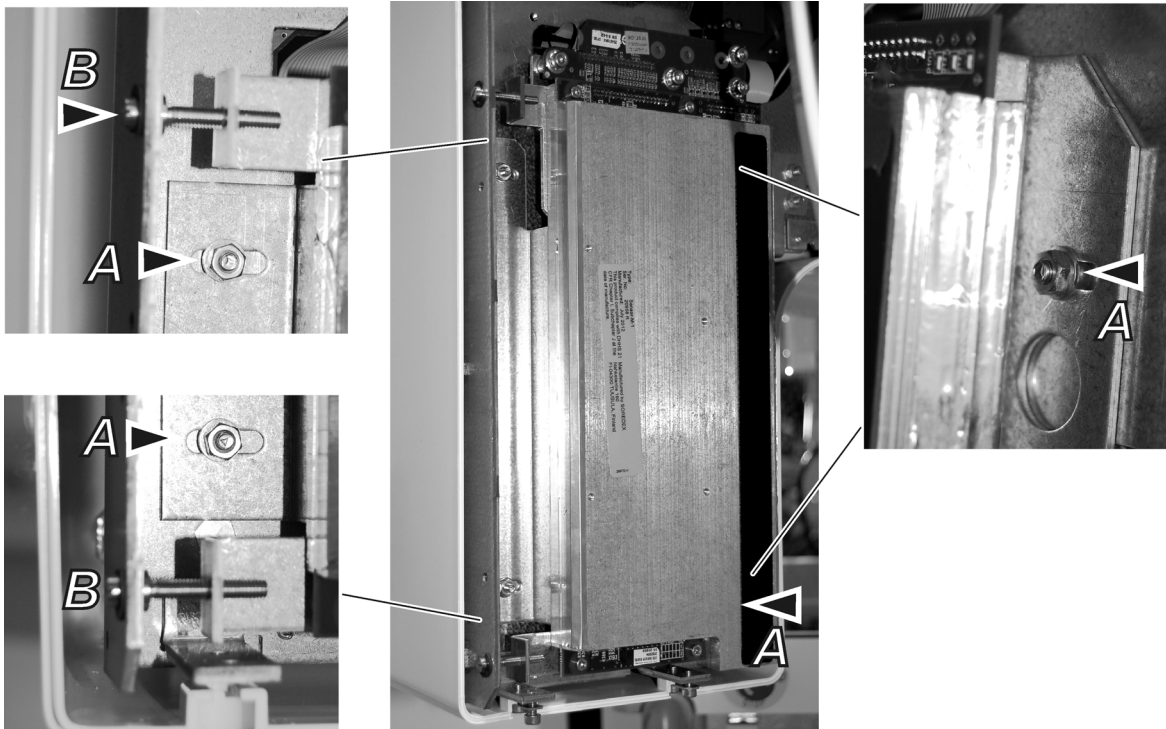
Adjust and recheck the position of the CCD sensor until the beam is vertical and centered in the middle of the CCD aperture.

Move CCD to right

Move CCD to left

Turn CCD counter clockwise

Turn CCD clockwise
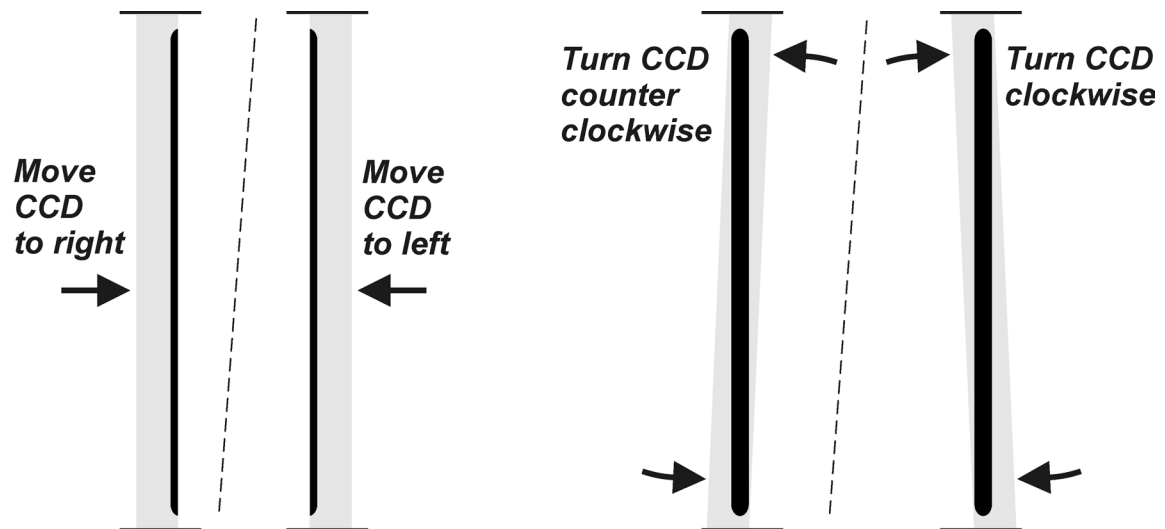
3. Touch the **Arrow** button to exit the Still Mode and return to the main menu.

5.2 Adjusting the image geometry
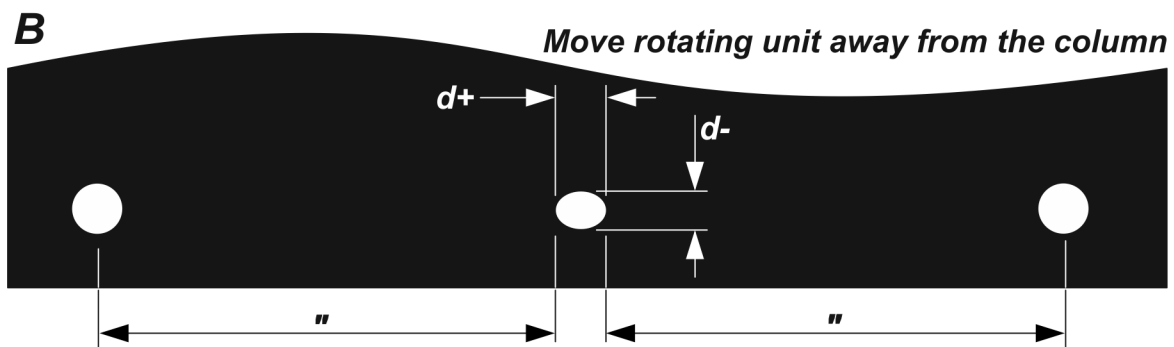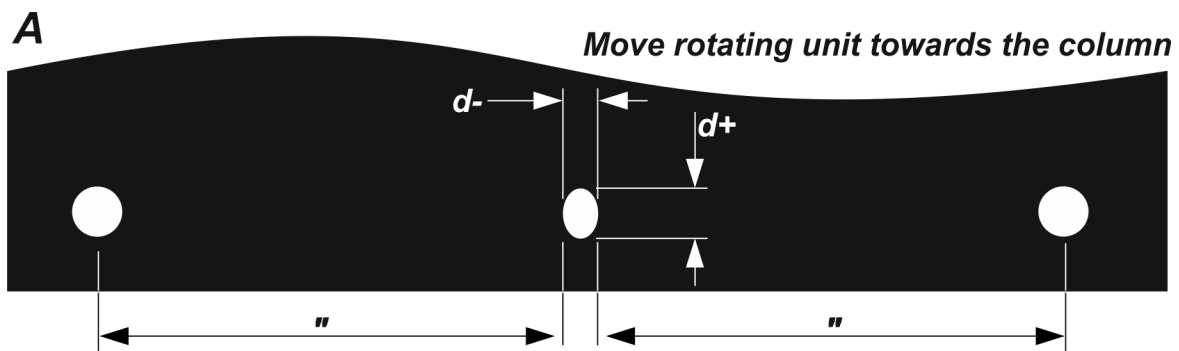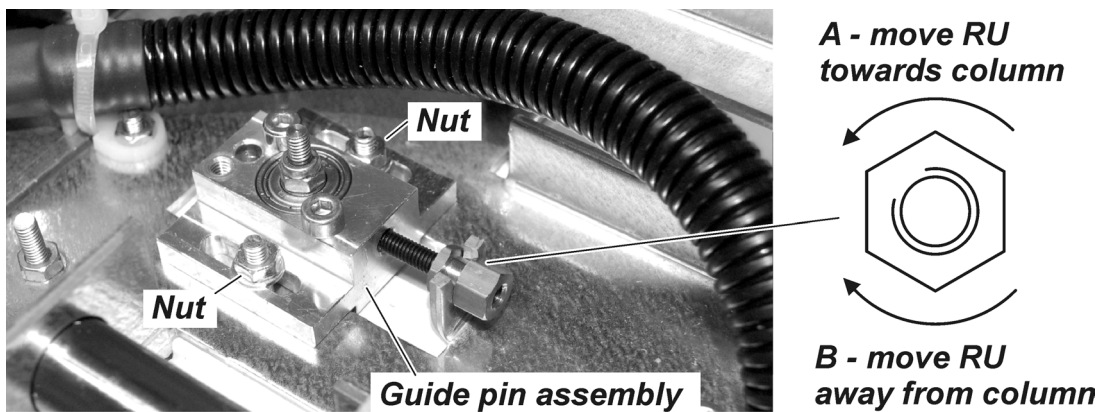
IMPORTANT NOTE:
In some cases you may have to adjust the position of both the rotating unit AND the chin rest.

Center ball not round

If the center ball is NOT ROUND then the position of the rotating unit (RU) must be must be adjusted.

1. Loosen the two nuts that hold the guide pin assembly in place.

    Turn the adjusting nut counter clockwise to move the rotating unit towards the column and clockwise to move it away from the column.

Nut

Nut

Guide pin assembly

A - move RU towards column

B - move RU away from column

A   *Move rotating unit towards the column*

d-   *d+*

"   *"*

B   *Move rotating unit away from the column*

d+   *d-*

"   *"*

2. Re-tighten the guide pin assembly nuts after the adjustment.

3. Take another ball-pin exposure to confirm the center ball is round. Also verify that the distances from center ball to left and right pins are equal, if not proceed to the next section, **Distances between left and right pins not equal**.

Distances between center ball and left and right balls not equal

If the distances between the center ball and the left and right balls are DIFFERENT then the chin support (CS) must be must be adjusted.
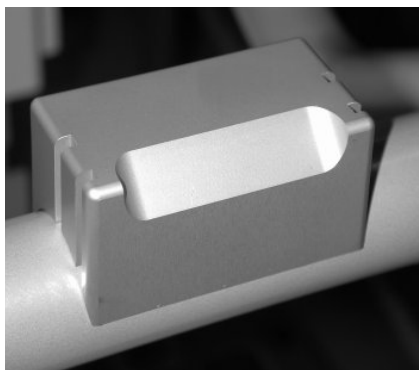
1. To adjust the chin support, first remove the Chin Support Holder (1 screw accessible from the underside of the patient support handle).
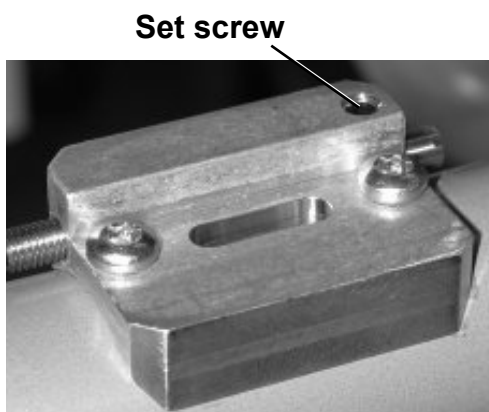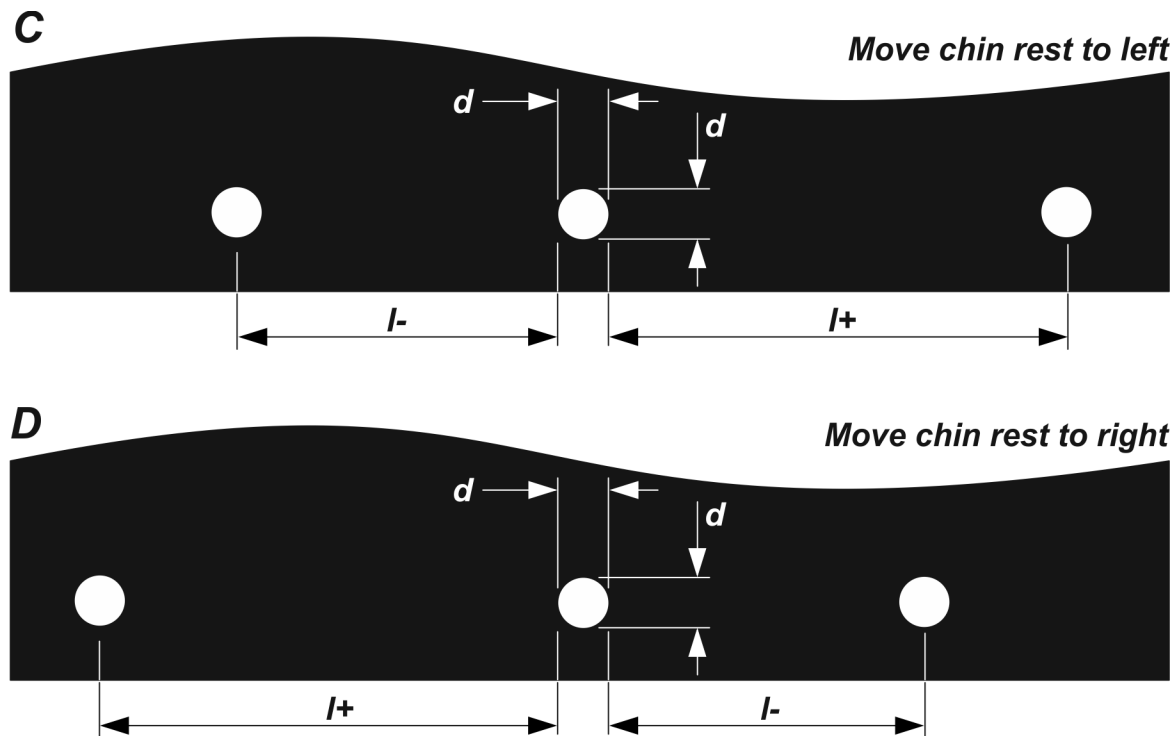
Set screw

2. Loosen the set screw that holds the Lower Shelf Screw (the horizontal screw) in position and turn it to adjust the position of the Chin Support Holder.

If the right-hand distance is greater that the left (C), move the chin rest to the left.
If the left-hand distance is greater that the right (D), move the chin rest to the right.

CAUTION:
DO NOT loosen the screws (2) that attach the Chin Support Holder to the Patient Handle.

Move chin rest to left

Move chin rest to right

3. Take another ball-pin exposure to confirm the unit is now correctly aligned. Readjust if required.

4. After the adjustment has been done retighten the set screw and replace the Chin Support Holder.

5.3 Aligning the positioning lights

Midsagittal and frankfort

1. Remove the corner piece, it pulls off.

2. Remove the lower cover (2 screws).

The midsagittal light can now be accessed and adjusted, see step 5.

3. To access the frankfort light remove the side profile left assembly (4 screws).
    CAUTION:
    Be careful not to damage the flat cables that attach the exposure warning light and control panel to the unit.


5 screws behind mirror

4. Remove the mirror assembly. It is held in place with 6 screws located behind the mirror.

5. Both the midsagittal and frankfort lights have similar adjusting mechanisms. Loosen the clamping screw on the light module and rotate the light to position beam vertically. For left/ right beam movements loosen the nuts/screws that hold the light module bracket in position and adjust the laser lights accordingly.
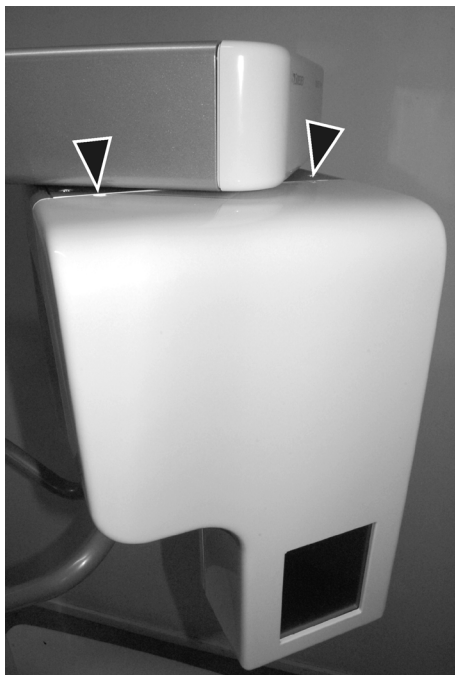
Left / right adjustment

Rotation adjustment
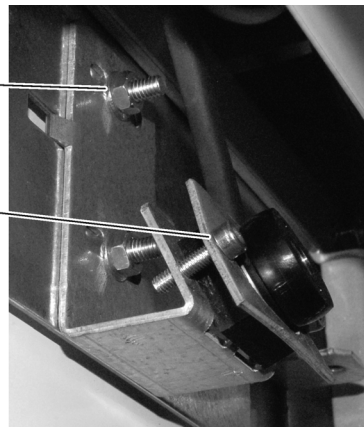
Focal trough

1. Loosen the five (5) screws that hold the sensor inner cover in place and then remove the cover.

2. Loosen the clamping screw on the light module and then rotate the light to position beam vertically. To adjust the beam in the up/down left/right directions loosen the nuts/screws that hold the light module bracket in position and adjust the laser lights accordingly.


left / right adjustment

rotation adjustment

5.4 Calibrating the CCD sensor

NOTE! The CCD sensor is calibrated at the factory and thus does not normally need to be calibrated again.

However, if the dental imaging software prompts an error message "Please calibrate the device" on startup, perform CCD re-calibration as instructed below.

1. **PC**: Prepare the unit for an exposure.

2. Touch the service button on the main control panel of the unit to open the configuration window.
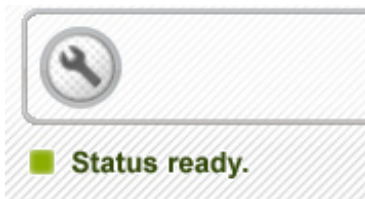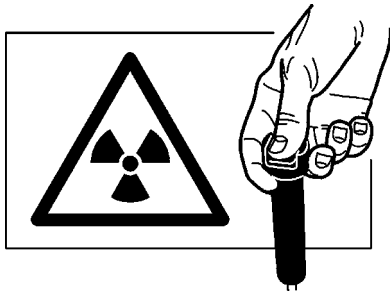
3. Select Installation Commands.

4. The personal identification number (PIN) screen will appear.
   Key in 1204 and touch the OK key.
   Then select Image Calibration.

5. Remove the chin rest and make sure that there is nothing between the sensor and tubehead.

6. Protect yourself from radiation, and take an exposure.

7. PC: Use the dental imaging software to examine the image. It should be evenly grey all over with no granularity nor horizontal lines/stripes. If the image is not evenly gray repeat the calibration until it is. If artefacts appear on the image make sure that there is nothing between the sensor and the tubehead.

8. Touch the Arrow button to exit **Image Calibration**.